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Drinking Water Surveillance Program

ALVINSTON WATER TREATMENT PLANT

Annual Report 1989



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**ALVINSTON
WATER TREATMENT PLANT**

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT 1989

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EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM
ALVINSTON WATER TREATMENT PLANT
1989 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1989, 65 plants were being monitored.

The Alvinston Water Treatment Plant is a conventional treatment plant which treats water from the Sydenham River. The process consists of coagulation, flocculation, clarification, filtration and disinfection. Powdered activated carbon is added on a seasonal basis for taste and odour control and pesticide removal. The process of complete water softening was initiated in April 1989. This plant has a design capacity of $0.775 \times 1000 \text{ m}^3/\text{day}$ and serves a population of approximately 800.

Raw and Treated water samples were taken on a monthly basis in 1989 and were analyzed for the presence of approximately 180 parameters. Parameters were divided into the following groups: Bacteriological, Inorganic and Physical (Laboratory Chemistry, Field Chemistry and Metals) and Organics (Chloroaromatics, Chlorophenols, Pesticides and PCB, Phenolics, Polyaromatic Hydrocarbons, Specific Pesticides and Volatiles). Samples were analyzed for Specific Pesticides and Chlorophenols in June and December only.

A summary of results is shown in Table A.

The Ontario Drinking Water Objective (ODWO) for Total Nitrates of 10.0 mg/L was exceeded in the March and November treated water samples with values of 10.4 mg/L. The District Officer was notified.

All other Inorganic and Physical parameters (Laboratory Chemistry, Field Chemistry and Metals) were below applicable health related ODWOs.

Samples were analyzed monthly for the presence of approximately 110 Organics. Levels did not exceed any health related guidelines.

The 1989 DWSP sampling results confirm those of previous years and indicate that the source water is adversely impacted as a result of agricultural activities in the watershed.

TABLE A

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP

SUMMARY TABLE BY SCAM

SCAM	RAW		TREATED	
	TESTS	POSITIVE	TESTS	POSITIVE
BACTERIOLOGICAL	36	32	88	9
CHEMISTRY (FLD)	36	35	97	71
CHEMISTRY (LAB)	252	234	92	190
METALS	288	197	68	146
CHLOROPHENOLS	168	0	0	0
CHLOROPHENOLS	12	0	0	0
PAH	188	0	0	0
PESTICIDES & PCB	408	3	0	0
PHENOLICS	12	11	91	8
SPECIFIC PESTICIDES	65	0	0	0
VOLATILES	348	8	2	46
TOTAL	1813	520	1793	470

NO KNOWN HEALTH RELATED GUIDELINES WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE

A ' ' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

ALVINSTON WATER TREATMENT PLANT
1989 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1989, 65 plants were being monitored.

The DWSP was initiated at the Alvinston Water Treatment Plant in the summer of 1985 as part of the Alachlor pesticide study in Southwestern Ontario. DWSP annual reports were published for 1986 (ISBN 0-7729-2548-0), 1987 and 1988 (ISSN 0839-8992).

This report contains information and results for 1989.

In order to accommodate the increasing number of plants on the DWSP and to facilitate the timely completion of the 1989 annual reports, plants with two or more years of published data will receive an abbreviated annual report. This report maintains the same general format as in previous years but does not include a comprehensive discussion of results. For more detail on the parameters analyzed and discussion of results, consult the 1987 and 1988 reports.

PLANT DESCRIPTION

The Alvinston Water Treatment Plant is a conventional treatment plant which treats water from the Sydenham River. The process consists of coagulation, flocculation, clarification (solids contact upflow clarifier), filtration and disinfection. A polyelectrolyte is used as a coagulant aid and powdered activated carbon is used on a seasonal basis for taste and odour control and pesticide removal. The process of complete water softening was initiated in April 1989. The Alvinston plant has a design capacity of $0.775 \times 1000 \text{ m}^3/\text{day}$ and flows for day of sampling ranged from $0.1 \times 1000 \text{ m}^3/\text{day}$ to $0.300 \times 1000 \text{ m}^3/\text{day}$. This plant serves a population of approximately 800.

The plant location is shown in Figure 1. Plant process details, in a block schematic, are shown in Figure 2. General plant information is presented in Table 2.

SAMPLING AND ANALYSIS

Plant operating personnel perform analyses on parameters for process control (Table 1).

Water at the Alvinston Water Treatment plant was sampled for the presence of approximately 180 parameters monthly in 1989. Samples were analyzed for Specific Pesticides and Chlorophenols in June and

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM

SITE LOCATION MAP

ALVINSTON WATER TREATMENT PLANT

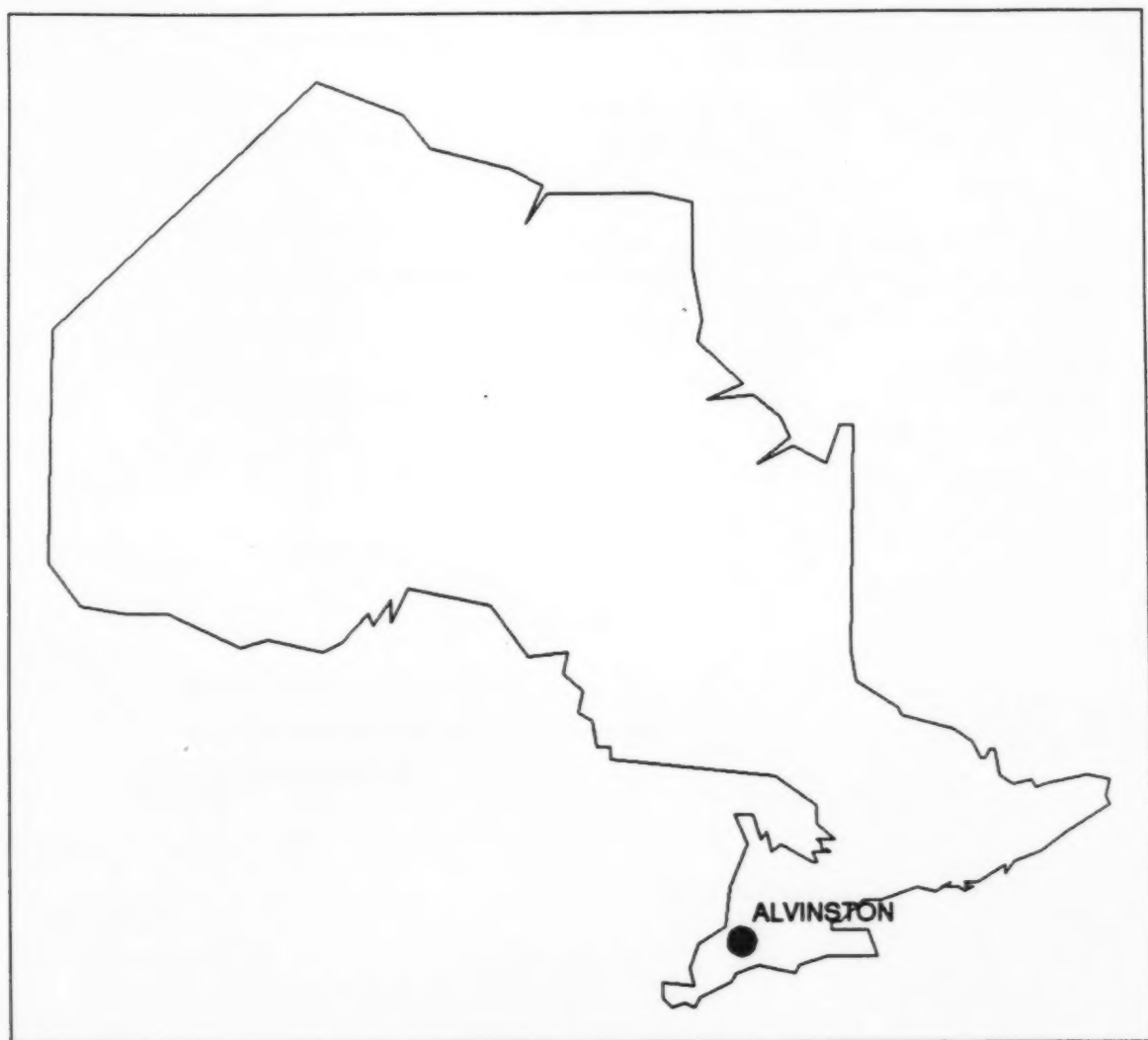


FIGURE 2

ALVINSTON WATER TREATMENT PLANT

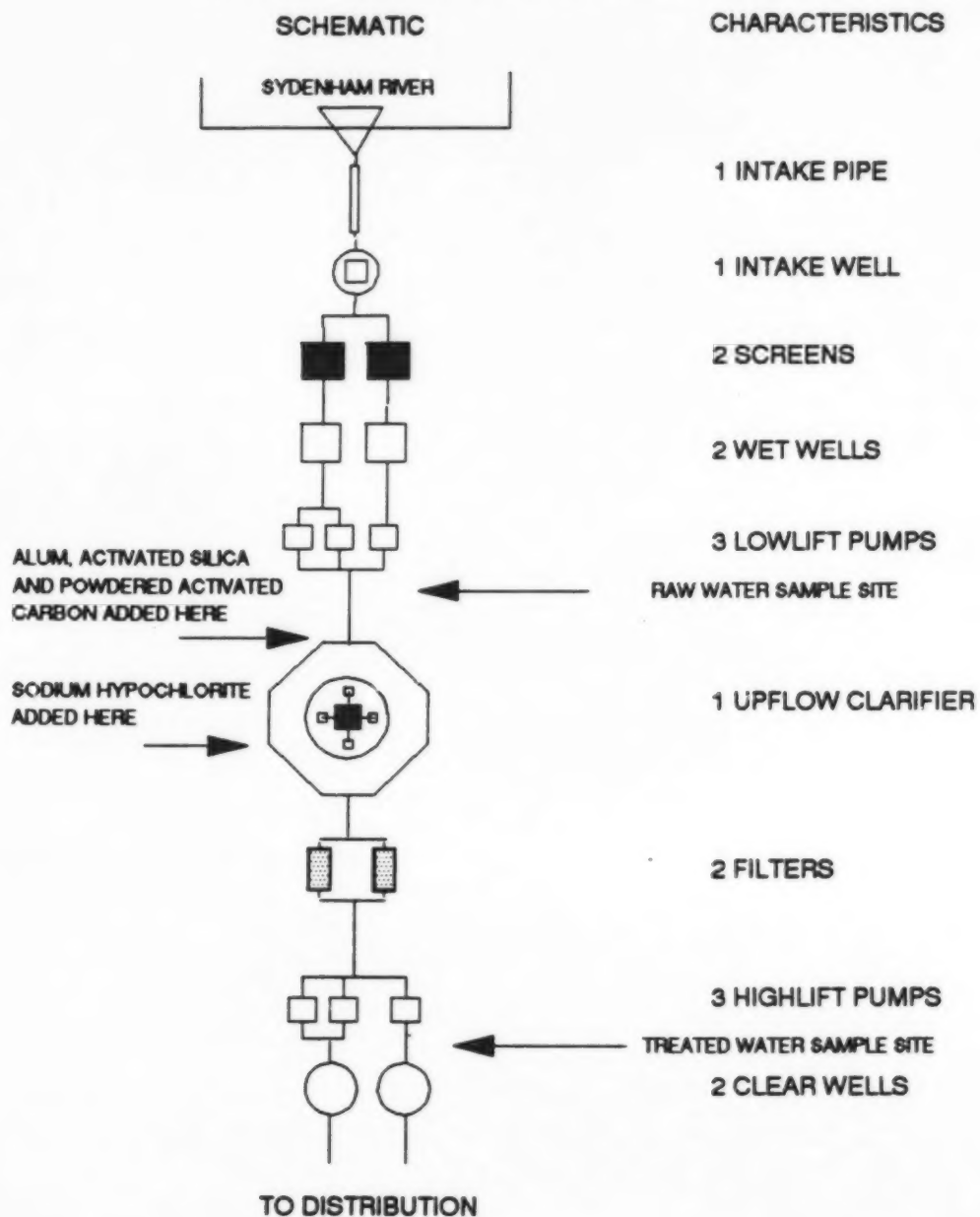


TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORTIN-PLANT MONITORING ALVINSTON WTP 1989

<u>PARAMETER</u>	<u>LOCATION</u>	<u>FREQUENCY</u>
Chlorine Residual-total	Treated water	3 times/day
combined	Treated water	3 times/day
pH	Raw water	daily
	Treated water	daily
Turbidity	Treated water	daily
Temperature	Raw water	daily

TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

ALVINSTON WATER TREATMENT PLANT

LOCATION: P.O. BOX 29
ALVINSTON, ONTARIO
N0N 1A0
(519-898-2047)

SOURCE: RAW WATER SOURCE - SYDENHAM RIVER

DESIGN CAPACITY: 0.775 (1000 M³/DAY)

OPERATION: MINISTRY OF ENVIRONMENT

PLANT SUPERINTENDENT: T. WRIGHT

MINISTRY REGION: SOUTHWESTERN

DISTRICT OFFICER: O. WIGLE

MUNICIPALITY
SERVED

TOWN OF ALVINSTON

POPULATION

800

November only. Only the raw and treated water at the plant was analyzed for Polyaromatic Hydrocarbons and Phenolics. Laboratory analysis was conducted at the Ministry of the Environment facilities in Rexdale, Ontario.

RESULTS

Field chemistry measurements were recorded on the day of sampling and were entered onto the DWSP data base as submitted by plant personnel.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analyzed by parameter and by water type. The number of times that a positive or trace result was detected is also reported. Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment (MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 presents parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on tables 5 and 6. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters. These are currently under review. When an ODWO is not available, guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS), recently published (ISBN 0-7729-4461-X) by the MOE, catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

Many of the compounds detected are naturally occurring or are treatment by-products.

IN THIS REPORT, DISCUSSION IS LIMITED TO THE TREATED WATER AND ADDRESSES ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES AND ORGANICS

WITH DETECTED POSITIVE RESULTS.

Results for treated water indicate that the health related guideline for nitrate was exceeded in two samples. No other health related guideline was exceeded.

Bacteriology

Although the ODWO for Total Coliform of 5 counts/mL was reached in the treated water in March, the District Officer was not notified since much more frequent sampling than monthly is required to assess the bacteriological quality. Such sampling is the responsibility of the purveyor.

Inorganic and Physical Parameters

NITRATE

The ODWO of 10.0 mg/L for Total Nitrate was exceeded (at 10.4 mg/L) in the March and November treated water samples. The District Officer was notified.

TURBIDITY

The ODWO of 1 Formazin Turbidity Unit (FTU) was exceeded in the December treated water sample with a reported laboratory turbidity value of 5.4 FTU. This value was not supported by the field turbidity result. Protocol for turbidity states that measurements

should be made within 48 hours. This is not always achieved except when measured in the field. The field turbidity values, therefore, are considered more reliable.

HARDNESS

The aesthetic ODWO indicates that a hardness level of between 80 and 100 mg/L, as the equivalent quantity of calcium carbonate, is appropriate and water supplies with a hardness greater than 200 mg/L are considered poor. Hardness values in the Alvinston supply ranged from 174 to 373 mg/L.

Other parameters associated with hardness, calcium and conductivity were also above reported aesthetic objectives.

ALUMINUM

The plant operational guideline of 100 $\mu\text{g/L}$ as Al in the water leaving the plant was exceeded in seven treated water samples. There were four unusually high results with a maximum concentration of 6,612 $\mu\text{g/L}$. The Alvinston Water Treatment Plant initiated a full water softening process in April 1989. This includes the addition of sodium carbonate, hydrated lime and carbon dioxide. If the chemical balance of the reaction is not within the optimum limits for the coagulation process, then an excess of aluminum can be expected in the treated water. A period of adjustment is required to determine the optimum dosages and injection points.

ORGANICS

Trihalomethanes

Trihalomethanes (THMs) are acknowledged to be produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of Chloroform, Chlorodibromomethane and Dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. All Total THM occurrences, ranging from 7.3 to 88.7 $\mu\text{g/L}$, were well below the ODWO of 350 $\mu\text{g/L}$.

CONCLUSIONS

Health related ODWO guidelines were exceeded in 1989 for Total nitrates which were above the guideline in two treated water samples.

The results listed in this report for 1989 are consistent with results reported for previous years.

The additional process of complete water softening instituted at the treatment plant during 1989 caused a period of imbalance and adjustment as shown by the unusually high Aluminum residuals recorded for several DWSP samples.

Powdered Activated Carbon is applied to the treatment process for

taste and odour control and to effect the removal of pesticides. Results indicate that the addition of powder activated carbon has a beneficial effect on the treatment process.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP SAMPLE DAY CONDITIONS FOR 1989

SAMPLE DAY CONDITIONS			TREATMENT CHEMICAL DOSAGES (MG/L)					POST PH ADJUSTMENT
DATE	DELAY * TIME (HRS)	FLOW TIME (1000G3)	COAGULATION ALUM LIQUID	COAGULATION AID POLYELECTROLYTE	TASTE & ODOR ACTIVATED CARBON POWDER	POST-CHLORINATION CHLORINE	SODIUM HYPOCHLORITE	
JAN 16	6.5	.0	30.00	.04	-	2.50	-	-
FEB 28	6.0	.0	28.00	.04	-	3.00	-	-
MAR 29	7.0	.2	60.00	.04	5.00	-	1.50	-
MAY 02	6.0	.2	96.00	.04	5.00	2.00	-	-
MAY 15	7.0	.2	60.00	.04	5.00	-	2.00	-
JUL 05	6.0	.0	80.00	.04	5.00	-	3.00	-
JUL 25	7.0	.3	40.00	.04	5.00	-	3.00	-
AUG 21	.0	.2	70.00	.04	5.00	-	1.50	-
SEP 19	.0	.3	80.00	.04	5.00	-	2.50	10.00
OCT 16	.0	.2	62.00	.04	5.00	-	2.50	10.00
NOV 23	.0	.0	30.00	.04	5.00	-	5.00	-
DEC 18	.0	.0	8.00	.08	5.00	-	1.50	-

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	RAW		TREATED	
		TOTAL	POSITIVE TRACE	TOTAL	POSITIVE TRACE
BACTERIOLOGICAL	FECAL COLIFORM MF	12	10 0	.	.
	STANDARD PLATE CNT MF	.	.	12	6 0
	TOTAL COLIFORM MF	12	10 0	12	1 0
	T COLIFORM BCKGRD MF	12	12 0	12	2 0
*TOTAL SCAM BACTERIOLOGICAL		36	32 0	36	9 0
*TOTAL GROUP BACTERIOLOGICAL		36	32 0	36	9 0
CHEMISTRY (FLD)	FLD CHLORINE (COMB)	.	.	12	12 0
	FLD CHLORINE FREE	.	.	12	12 0
	FLD CHLORINE (TOTAL)	.	.	12	12 0
	FLD PH	12	12 0	12	12 0
	FLD TEMPERATURE	12	11 0	12	11 0
	FLD TURBIDITY	12	12 0	12	12 0
*TOTAL SCAM CHEMISTRY (FLD)		36	35 0	72	71 0
CHEMISTRY (LAB)	ALKALINITY	12	12 0	12	12 0
	CALCIUM	12	12 0	12	12 0
	CYANIDE	12	0 0	12	0 0
	CHLORIDE	12	12 0	12	12 0
	COLOUR	12	12 0	12	5 4
	CONDUCTIVITY	12	12 0	12	12 0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1969)

SCAM	PARAMETER	RAW		TREATED	
		TOTAL	POSITIVE TRACE	TOTAL	POSITIVE TRACE
CHEMISTRY (LAB)	FLUORIDE	12	11	12	10
	HARDNESS	12	0	12	0
	IRONICAL	12	0	12	0
	LANGLIERS INDEX	12	0	12	0
	MAGNESIUM	12	0	12	0
	SODIUM	12	0	12	0
	AMMONIUM TOTAL	12	8	12	4
	NITRITE	12	0	12	3
	TOTAL NITRATES	12	0	12	0
	NITROGEN TOT KJELD	12	0	12	0
	PH	12	0	12	0
	PHOSPHORUS FIL REACT	12	11	12	0
	PHOSPHORUS TOTAL	12	0	12	0
	SULPHATE	12	0	12	0
	TURBIDITY	12	0	12	0
	*TOTAL SCAM CHEMISTRY (LAB)	252	234	252	190
			2		37
METALS	SILVER	12	0	11	0
	ALUMINUM	12	0	11	0
	ARSENIC	12	11	11	2
	BARIUM	12	0	11	0
	BORON	12	0	11	0
	BERYLLIUM	12	1	11	0

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	RAW		TREATED			
		TOTAL	POSITIVE TRACE	TOTAL	POSITIVE TRACE		
METALS	CADMIUM	12	0	2	11	0	2
	COBALT	12	1	8	11	0	7
	CHROMIUM	12	11	1	11	10	1
	COPPER	12	11	1	11	7	4
	IRON	12	12	0	11	0	2
	MERCURY	12	7	1	12	7	1
	MANGANESE	12	12	0	11	8	3
	NOLYDIENUM	12	11	1	11	11	0
	NICKEL	12	2	4	11	1	4
	LEAD	12	11	1	11	4	6
	ANTIMONY	12	11	1	11	10	1
	SELENIUM	12	0	7	11	1	8
	STRONTIUM	12	12	0	11	11	0
	TITANIUM	12	12	0	11	11	0
	THALLIUM	12	0	3	11	0	3
	URANIUM	12	12	0	11	8	3
	VANADIUM	12	12	0	11	11	0
	ZINC	12	12	0	11	11	0
	*TOTAL SCAN METALS		288	197	46	285	146
*TOTAL GROUP INORGANIC & PHYSICAL		576	466	48	589	407	101

CHLOROAROMATICS							
	HEXACHLOROBUTADIENE	12	0	0	11	0	0
	123 TRICHLOROBENZENE	12	0	0	11	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	RAW		TREATED	
		TOTAL	POSITIVE TRACE	TOTAL	POSITIVE TRACE
CHLOROBROMATICS					
	1234 T-CHLOROBENZENE	12	0	11	0
	1235 T-CHLOROBENZENE	12	0	11	0
	124 TRICHLOROBENZENE	12	0	11	0
	1245 T-CHLOROBENZENE	12	0	11	0
	135 TRICHLOROBENZENE	12	0	11	0
	MCB	12	0	11	0
	HEXACHLOROCYCLOHEXANE	12	0	11	0
	OCTACHLOROCYCLOHEXANE	12	0	11	0
	PENTACHLOROBENZENE	12	0	11	0
	236 TRICHLOROTOLUENE	12	0	11	0
	245 TRICHLOROTOLUENE	12	0	11	0
	246 TRICHLOROTOLUENE	12	0	11	0
*TOTAL SCAN CHLOROBROMATICS		168	0	154	0
CHLOROPHENOLS					
	234 TRICHLOROPHENOL	2	0	2	0
	2345 T-CHLOROPHENOL	2	0	2	0
	2356 T-CHLOROPHENOL	2	0	2	0
	245-TRICHLOROPHENOL	2	0	2	0
	246-TRICHLOROPHENOL	2	0	2	0
	PENTACHLOROPHENOL	2	0	2	0
*TOTAL SCAN CHLOROPHENOLS		12	0	12	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	RAW		TREATED	
		TOTAL	POSITIVE TRACE	TOTAL	POSITIVE TRACE
PAH	PHENANTHRENE	12	0	12	0
	ANTHRACENE	12	0	12	0
	FLUORANTHRENE	12	0	12	0
	PYRENE	12	0	12	0
	BENZO(A)ANTHRACENE	12	0	12	0
	CHRYSENE	12	0	12	0
	DIMETH. BENZ(A)ANTHR	4	0	5	0
	BENZO(E) PYRENE	12	0	12	0
	BENZO(B) FLUORANTHENE	12	0	12	0
	PERYLENE	12	0	12	0
	BENZO(K) FLUORANTHENE	12	C	12	0
	BENZO(A) PYRENE	4	0	5	0
	BENZO(G,N,I) PERYLENE	12	0	12	0
	DIBENZO(A,H) ANTHRAC	12	0	12	0
	INDENO(1,2,3-C,D) PY	12	0	12	0
	BENZO(B) CHRYSENE	12	0	12	0
	CORONENE	12	0	12	0
*TOTAL SCAN PAH		188	0	190	0
PESTICIDES & PCB	ALDRIN	12	0	11	0
	ALPHA BHC	12	0	11	0
	BETA BHC	12	0	11	0
	LINDANE	12	0	11	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1989)

SCAM	PARAMETER	RAW		TREATED	
		TOTAL	POSITIVE TRACE	TOTAL	POSITIVE TRACE
PESTICIDES & PCB	ALPHA CHLORDANE	12	0	11	0
	GAMMA CHLORDANE	12	0	11	0
	DIELDRIN	12	0	11	0
	METHOXYCHLOR	12	0	11	0
	ENDOSULFAM I	12	0	11	0
	ENDOSULFAM II	12	0	11	0
	ENDRIN	12	0	11	0
	ENDOSULFAM SULPHATE	12	0	11	0
	HEPTACHLOR EPOXIDE	12	0	11	0
	HEPTACHLOR	12	0	11	0
	WIREX	12	0	11	0
	ORYZCHLORDANE	12	0	11	0
	OPDDT	12	0	11	0
	PCB	12	0	11	0
	DDO	12	0	11	0
	PPDDE	12	0	11	0
	PPDDT	12	0	11	0
	AMETRINE	12	0	12	0
	ATRAZINE	12	3	4	3
	ATRAZONE	12	0	12	0
	CYAMAZINE (BLADEX)	12	0	12	0
	D-ETHYL ATRAZINE	12	0	3	0
	D-ETHYL SIMAZINE	12	0	12	0
	PROMETONE	12	0	12	0
	PROPACINE	12	0	12	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	RAW		TREATED	
		TOTAL POSITIVE	TRACE	TOTAL POSITIVE	TRACE
PESTICIDES & PCB					
	PROMETRYNE	12	0	0	12
	METRIBUZIN (SENCOR)	12	0	0	12
	STIMAZINE	12	0	0	12
	ALACHLOR (LASSO)	12	0	0	12
	METOLACHLOR	12	0	0	12
*TOTAL SCAN PESTICIDES & PCB		408	3	7	367
PHENOLICS					
	PHENOLICS	12	11	1	12
*TOTAL SCAN PHENOLICS		12	11	1	12
SPECIFIC PESTICIDES					
	TOLUAPHENE	12	0	0	11
	2,4,5-T	2	0	0	2
	2,4-D	2	0	0	2
	2,4-DB	2	0	0	2
	2,4-D PROPIONIC ACID	2	0	0	2
	DICAMBA	2	0	0	2
	PICHLORAM	0	0	0	0
	SILVEX	2	0	0	2
	DIAZINON	2	0	0	2
	DICHLOROVOS	2	0	0	2
	CHLORPYRIFOS	2	0	0	2

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	RAW		TREATED	
		TOTAL	POSITIVE TRACE	TOTAL	POSITIVE TRACE
SPECIFIC PESTICIDES	ETNION	2	0	2	0
	AZINPHOS-METHYL	0	0	0	0
	MALATHION	2	0	2	0
	NEVINPHOS	2	0	2	0
	METHYL PARATHION	2	0	2	0
	METHYLTRITHION	2	0	2	0
	PARATHION	2	0	2	0
	PHORATE	2	0	2	0
	RELDAN	2	0	2	0
	RONNEL	2	0	2	0
	APHIDOCARB	0	0	1	0
	BENOMYL	1	0	1	0
	BUX	0	0	0	0
	CARBOPURAN	2	0	2	0
	CICP	2	0	2	0
	DIALATE	2	0	2	0
	EPTAM	2	0	2	0
	IPC	2	0	2	0
	PROPOXUR	2	0	2	0
	CARBARYL	2	0	2	0
	BUTYLATE	2	0	2	0
	*TOTAL SCAN SPECIFIC PESTICIDES	65	0	65	0
VOLATILES					
	BENZENE	12	0	12	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	RAW		TREATED	
		TOTAL	POSITIVE TRACE	TOTAL	POSITIVE TRACE
VOLATILES	TOLENE	12	1	3	0
	ETHYLBENZENE	12	1	6	12
	P-XYLENE	12	0	0	12
	M-XYLENE	12	1	4	12
	O-XYLENE	12	1	5	12
	STYRENE	12	2	8	12
	1,1 DICHLOROETHYLENE	12	0	0	12
	METHYLENE CHLORIDE	12	0	0	12
	1,1,2,2TETRACHLOROETHYLENE	12	0	0	12
	1,1 DICHLOROETHANE	12	0	0	12
	CHLOROFORM	12	0	1	12
	111, TRICHLOROETHANE	12	2	3	12
	1,2 DICHLOROETHANE	12	0	0	12
	CARBON TETRACHLORIDE	12	0	0	12
	1,2 DICHLOROPROPANE	12	0	0	12
	TRICHLOROETHYLENE	12	0	0	12
	DICHLOROBROMOETHANE	12	0	0	12
	112 TRICHLOROETHANE	12	0	0	12
	CHLORODIBROMOETHANE	12	0	0	12
	T-CHLOROETHYLENE	12	0	2	12
	BROMOFORM	12	0	0	12
	1122 T-CHLOROETHANE	12	0	0	12
	CHLOROBENZENE	12	0	0	12
	1,4 DICHLOROBENZENE	12	0	0	12
	1,3 DICHLOROBENZENE	12	0	0	12

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	RAW		TREATED	
		TOTAL	POSITIVE TRACE	TOTAL	POSITIVE TRACE
VOLATILES	1,2 DICHLOROETHYLENE	12	0	0	0
	ETHYLENE DIBROMIDE	12	0	0	0
	TOTAL TRICHLOROETHYLENES	12	0	0	0
*TOTAL SCAN VOLATILES		348	8	32	46
*TOTAL GROUP ORGANIC		1201	22	40	54
TOTAL		1813	520	88	1793
					470
					154

KEY TO TABLE 5 and 6

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
 - 1+. MAC for Total Trihalomethanes
 - 1*. MAC for Bacteriological Analyses
- Poor water quality is indicated when :
- total coliform counts > 0 < 5
 - P/A Bottle Test is present after 48 hours
 - Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
 - Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
 - Standard Plate Count should not exceed 500 organisms per ml at 35 °C within 48 hours
2. Interim Maximum Acceptable Concentration (IMAC)
 3. Maximum Desirable Concentration (MDC)
 4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness >200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.
- B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
 2. Proposed MAC
 3. Interim MAC
 4. Aesthetic Objective (AO) (for xylenes, the AO is a total)
- C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
 2. Tentative GV
 3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
 2. Suggested No-Adverse Effect Level (SNAEL)
 3. Lifetime Health Advisory
 4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
 2. Aesthetic Guideline Level
 3. Maximum Admissible Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- H USSR MAXIMUM PERMISSIBLE CONCENTRATION
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

INTERPRETATION OF DATA

The interpretation of analytical results that are obtained from measurements near the limit of detection of the measurement process is subject to greater uncertainty than those at higher concentrations. The principle areas of concern relate to whether the substance has actually been detected, whether it has been properly identified, and whether it is an artifact of the measurement process. In other words, false positives can be caused by the instrumentation or the test procedures used, when in fact these compounds are not present in the sample.

There are several methods to treat data from such measurements:

1. Exclude the low-level data because of this uncertainty factor. Studies of long-term environmental trends and modelling may however, be adversely affected by the exclusion of such data.
2. Qualify these data so the user is aware of the greater uncertainty associated with their use.

For the Drinking Water Surveillance Program, measurements near the limit of detection of the measurement process are reported with the code "<T". Results qualified by "W" indicate a zero measurement. These results are reported for purposes of modelling and long-term trend analysis and no significance should be attributed to a single determination of a substance below "T" (a single determination may well be a false positive). Repeat analysis or additional data are needed before it can be stated with certainty that the substance in question was truly present. On the other hand, it is less likely that repeated detection of a substance at or near the limit of detection at a specific location is solely due to an artifact in the measurement system, and more likely represents a true positive. The average of such data however, is still only an estimate of the amount of substance present subject to the possible biases of the method used.

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!IV	No Data: Inverted Septum
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded

!NA	No Data: No Authorization To Perform Reanalysis
!NF	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
USD	Unreliable: Sample Decomposition Noted
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours
T# (T06)	Result Taken After # Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

BACTERIOLOGICAL

FECAL COLIFORM MF (CT/100ML)

DET'M LIMIT = 0

GUIDELINE = 0 (A1)

JAN	30 T48	.
FEB	12 T24	.
MAR	152 T48	.
MAY	0	.
	BDL	.
JUL	172	.
	180 A3C	.
AUG	74 A3C	.
SEP	244	.
OCT	60	.
NOV	196	.
DEC	20	.

STANDARD PLATE CNT MF ()

DET'M LIMIT =

GUIDELINE =

JAN	.	21 T48
FEB	.	2 <=>
MAR	.	7 <=>
MAY	.	2 <=>
	.	0
JUL	.	14
	.	420
AUG	.	0 <=>
SEP	.	3 <=>
OCT	.	22
NOV	.	10
DEC	.	10

TOTAL COLIFORM MF (CT/100ML)

DET'M LIMIT = 0

GUIDELINE = 5/100ML(A1)

JAN	8000 A3C	0 T48
FEB	940 T24	0 T24
MAR	15000 >	5 T48
MAY	540 A3C	0
	100 <=>	0
JUL	400 <=>	0
	1200 A3C	0
AUG	1800 A3C	0
SEP	3400 A3C	0
OCT	1600 A3C	0
NOV	13100 A3C	0
DEC	410 A3C	0

T COLIFORM BCKGRD MF (CT/100ML)

DET'M LIMIT = 0

GUIDELINE = N/A

JAN	50000 A3C	0 T48
FEB	3600 T24	0 T24
MAR	15000 >	12 T48

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

MAY	13400 A3C	0
	36000 A3C	0
JUL	57500 A3C	1
	48000 A3C	0
AUG	20000 A3C	0
SEP	58000 A3C	0
OCT	43000 A3C	0
NOV	90000 A3C	0
DEC	3900 A3C	0

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

MAY	8.000	8.400
	7.500	7.400
JUL	7.800	8.000
	7.840	7.970
AUG	8.050	7.560
SEP	8.000	8.100
OCT	7.700	7.700
NOV	8.100	7.500
DEC	7.800	7.900

FLD TEMPERATURE (DEG.C)

DET'N LIMIT = N/A

GUIDELINE = 15 (A1)

JAN	.500	1.000
FEB	.500	1.500
MAR	10.000	11.000
MAY	11.000	11.000
	14.000	12.500
JUL	20.500	22.000
	23.000	23.000
AUG	22.000	19.000
SEP	16.000	16.000
OCT	13.000	13.000
NOV	1.000	1.000
DEC	.000	.000

FLD TURBIDITY (FTU)

DET'N LIMIT = N/A

GUIDELINE = 1.0 (A1)

JAN	17.000	.400
FEB	6.000	.300
MAR	125.000	.160
MAY	20.000	.150
	24.000	.130
JUL	54.000	.150
	54.000	.130
AUG	32.000	.110
SEP	40.000	.120
OCT	30.000	.140
NOV	23.000	.160
DEC	9.000	.110

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

	RAW	TREATED

CHEMISTRY (FLD)		
FLD CHLORINE (COMB) ()		
JAN	.	.100
FEB	.	.400
MAR	.	.200
MAY	.	.100
	.	.100
JUL	.	.100
	.	.300
AUG	.	.200
SEP	.	.100
OCT	.	.100
NOV	.	.600
DEC	.	.100

FLD CHLORINE FREE ()		
JAN	.	.400
FEB	.	.200
MAR	.	.100
MAY	.	.500
	.	.300
JUL	.	.600
	.	.100
AUG	.	.500
SEP	.	.400
OCT	.	.400
NOV	.	.500
DEC	.	.500

FLD CHLORINE (TOTAL) ()		
JAN	.	.500
FEB	.	.600
MAR	.	.300
MAY	.	.600
	.	.400
JUL	.	.700
	.	.400
AUG	.	.700
SEP	.	.500
OCT	.	.500
NOV	.	.100
DEC	.	.600

FLD PH (DIMENSIONLESS)		
JAN	8.600	6.700
FEB	7.900	7.000
MAR	7.800	6.500

DET'N LIMIT =

GUIDELINE =

DET'N LIMIT =

GUIDELINE =

DET'N LIMIT =

GUIDELINE =

DET'N LIMIT = N/A

GUIDELINE = 6.5-8.5(A4)

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

MAY	13.500	BDL
	12.500	BDL
JUL	13.000	BDL
	13.500	1.000 <T
AUG	10.500	1.000 <T
SEP	19.000	2.000 <T
OCT	17.000	2.000 <T
NOV	18.000	3.500
DEC	10.000	3.000

CONDUCTIVITY (UMHO/CM)

DET'N LIMIT = 1

GUIDELINE = 400 (F2)

JAN	678	709
FEB	692	738
MAR	592	626
MAY	618	657
	580	660
JUL	607	586
	557	601
AUG	515	666
SEP	577	534
OCT	616	644
NOV	615	656
DEC	759	776

FLUORIDE (MG/L)

DET'N LIMIT = .01

GUIDELINE = 2.400 (A1)

JAN	.120	.060
FEB	.120	.060
MAR	.140	.040 <T
MAY	.120	.120
	.120	.060
JUL	.140	.140
	.140	.100
AUG	.140	.080
SEP	.160	.100
OCT	.140	.100
NOV	.040 <T	.020 <T
DEC	.120	.100

HARDNESS (MG/L)

DET'N LIMIT = .500

GUIDELINE = 80-100 (A4)

JAN	335.000	337.000
FEB	338.000	340.000
MAR	291.000	290.000
MAY	324.000	182.000
	282.000	264.000
JUL	319.000	193.000
	271.000	220.000
AUG	261.000	297.000

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

CHEMISTRY (LAB)

ALKALINITY (MG/L)

DET'M LIMIT = .200

GUIDELINE = 30-500 (A4)

JAN	250.300	207.100
FEB	247.200	204.000
MAR	172.600	99.800
MAY	211.000	62.200
	199.000	142.800
JUL	231.700	57.300
	209.400	121.700
AUG	195.300	185.100
SEP	206.200	71.300
OCT	189.400	132.800
NOV	143.000	109.600
DEC	266.500	260.100

CALCIUM (MG/L)

DET'M LIMIT = .100

GUIDELINE = 100 (F2)

JAN	104.000	105.000
FEB	104.000	104.000
MAR	91.400	91.600
MAY	97.600	49.400
	82.600	77.200
JUL	97.200	56.000
	80.800	63.800
AUG	74.600	90.000
SEP	81.200	48.000
OCT	87.600	84.200
NOV	114.000	115.000
DEC	114.000	115.000

CHLORIDE (MG/L)

DET'M LIMIT = .200

GUIDELINE = 250 (A3)

JAN	27.400	30.900
FEB	31.200	39.400
MAR	26.300	26.300
MAY	27.100	30.400
	26.400	31.200
JUL	25.300	30.200
	23.900	29.100
AUG	22.200	26.400
SEP	30.500	34.400
OCT	32.700	38.700
NOV	38.600	44.000
DEC	34.900	39.500

COLOUR (NZU)

DET'M LIMIT = .5

GUIDELINE = 5.0 (A3)

JAN	10.500	3.000
FEB	11.000	2.500
MAR	22.500	2.500

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

SEP	274.000	174.000
OCT	294.000	282.000
NOV	367.000	367.000
DEC	370.000	373.000

IONCAL (DMMSLESS)

DET'M LIMIT = N/A

GUIDELINE = N/A

JAN	4.670	5.370
FEB	.036	.005
MAR	2.615	.799
MAY	6.121	4.585
	1.826	2.897
JUL	2.099	3.534
	1.931	2.267
AUG	.437	.081
SEP	.691	2.827
OCT	7.162	3.078
NOV	26.520	25.930
DEC	1.525	.643

LANGELIERS INDEX (DMMSLESS)

DET'M LIMIT = N/A

GUIDELINE = N/A

JAN	1.170	.331
FEB	1.294	.969
MAR	.948	.318
MAY	1.312	.593
	1.097	.768
JUL	1.091	.077
	1.322	.889
AUG	1.141	1.087
SEP	1.206	.220
OCT	.428	.955
NOV	1.060	.826
DEC	1.344	1.316

MAGNESIUM (MG/L)

DET'M LIMIT = .050

GUIDELINE = 30 (F2)

JAN	18.000	18.000
FEB	19.000	19.300
MAR	15.200	14.900
MAY	19.500	14.300
	18.400	17.300
JUL	18.500	12.900
	16.700	14.900
AUG	18.100	17.600
SEP	17.300	13.200
OCT	18.400	17.400
NOV	20.000	19.300
DEC	21.000	21.000

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW TREATED

SODIUM (MG/L)

DET'M LIMIT = .200

GUIDELINE = 200 (C3)

JAN	13.200	17.200
FEB	17.400	23.200
MAR	8.400	10.000
MAY	12.200	68.600
	12.200	33.600
JUL	11.600	46.400
	11.800	35.400
AUG	10.200	30.600
SEP	15.400	37.800
OCT	16.200	20.200
NOV	13.800	17.400
DEC	16.600	20.200

AMMONIUM TOTAL (MG/L)

DET'M LIMIT = 0.002

GUIDELINE = .05 (F2)

JAN	.160	.046
FEB	.300	.124
MAR	BDL	.034
MAY	BDL	.006 <T
	.044	.004 <T
JUL	.012	.004 <T
	.004 <T	.010
AUG	.014	.004 <T
SEP	BDL	.002 <T
OCT	.052	BDL
NOV	.064	BDL
DEC	.010	BDL

NITRITE (MG/L)

DET'M LIMIT = 0.001

GUIDELINE = 1.000 (A1)

JAN	.025	.003 <T
FEB	.024	.006
MAR	.135	.009
MAY	.069	.002 <T
	.034	.004 <T
JUL	.041	.001 <T
	.018	.005
AUG	.012	.002 <T
SEP	.012	BDL
OCT	.031	.003 <T
NOV	.049	BDL
DEC	.132	.001 <T

TOTAL NITRATES (MG/L)

DET'M LIMIT = .020

GUIDELINE = 10.000 (A1)

JAN	5.160	5.120
FEB	3.870	3.820
MAR	11.000	10.400
MAY	3.600	3.500

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

MAY	2.460	2.620
JUL	2.850	3.000
	1.950	1.840
AUG	1.020	1.100
SEP	1.940	1.920
OCT	2.750	3.570
NOV	10.500	10.400
DEC	5.220	5.110

NITROGEN TOT KJELD (MG/L)

DET'M LIMIT = .020

GUIDELINE = N/A

JAN	.730	.400
FEB	.790	.470
MAR	1.630	.440
MAY	.690	.230
	.675	.260
JUL	.750	.210
	.740	.180
AUG	.580	.210
SEP	.760	.240
OCT	.700	.330
NOV	.790	.510
DEC	.510	.350

PH (DIMENSIONLESS)

DET'M LIMIT = N/A

GUIDELINE = 6.5-8.5(A4)

JAN	8.230	7.470
FEB	8.360	8.120
MAR	8.220	7.830
MAY	8.470	8.580
	8.350	8.200
JUL	8.210	8.040
	8.560	8.470
AUG	8.440	8.340
SEP	8.450	8.150
OCT	7.680	8.380
NOV	8.320	8.200
DEC	8.340	8.320

PHOSPHORUS FIL REACT (MG/L)

DET'M LIMIT = .0005

GUIDELINE = N/A

JAN	.031	.000 <T
FEB	.008	.000 <T
MAR	.082	.001 <T
MAY	.009	.000 <T
	BDL	.001 <T
JUL	.035	BDL
	.039	.001 <T
AUG	.013	.001 <T
SEP	.009	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW TREATED

OCT	.008	BDL
NOV	.038	BDL
DEC	.009	BDL

PHOSPHORUS TOTAL (MG/L)

DET'M LIMIT = .002

GUIDELINE = .40 (F2)

JAN	.058	.004 <T
FEB	.039	.006 <T
MAR	.255	.003 <T
MAY	.050	.002 <T
	.045	.004 <T
JUL	.148	.003 <T
	.135	.003 <T
AUG	.076	.004 <T
SEP	.073	.004 <T
OCT	.056	.004 <T
NOV	.065	.002 <T
DEC	.025	.004 <T

SULPHATE (MG/L)

DET'M LIMIT = .200

GUIDELINE = 500. (A3)

JAN	69.680	119.960
FEB	68.700	112.080
MAR	50.040	129.950
MAY	65.360	191.230
	66.440	144.600
JUL	57.060	166.270
	49.600	129.590
AUG	51.730	131.630
SEP	51.190	131.460
OCT	60.000	111.190
NOV	75.740	107.760
DEC	75.840	82.630

TURBIDITY (FTU)

DET'M LIMIT = .02

GUIDELINE = 1.00 (A1)

JAN	18.600	.920
FEB	8.200	.580
MAR	194.000	.250
MAY	22.000	.800
	30.000	.500
JUL	84.000	2.900 USD
	88.000	.560
AUG	33.000	.290
SEP	35.000	.890
OCT	29.000	.750
NOV	10.300	.290
DEC	16.200	5.400 RRV

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW TREATED

METALS

SILVER (UG/L)

DET'N LIMIT = .020 GUIDELINE = 50. (A1)

JAN	BDL	BDL
FEB	.050 <T	.180 <T
MAR	BDL	.030 <T
MAY	BDL	BDL
	.040 <T	ISM
JUL	.060 <T	.030 <T
	BDL	BDL
AUG	.030 <T	BDL
SEP	BDL	BDL
OCT	BDL	BDL
NOV	BDL	BDL
DEC	BDL	BDL

ALUMINUM (UG/L)

DET'N LIMIT = .050 GUIDELINE = 100. (A4)

JAN	348.000	127.600
FEB	127.600	73.080
MAR	812.000	26.680
MAY	382.800	6612.000
	324.800	ISM
JUL	430.000	6200.000 RRV
	480.000	1700.000
AUG	310.000	240.000
SEP	410.000	2100.000 RRV
OCT	380.000	490.000
NOV	230.000	62.000
DEC	76.000	71.000

ARSENIC (UG/L)

DET'N LIMIT = 0.050 GUIDELINE = 50.0 (A1)

JAN	.970 <T	BDL
FEB	1.400	.710 <T
MAR	1.300	.320 <T
MAY	1.400	.470 <T
	2.300	ISM
JUL	2.100	.340 <T
	2.900	1.200
AUG	2.300	.750 <T
SEP	1.900	.300 <T
OCT	1.400	.250 <T
NOV	1.100	.680 <T
DEC	1.300	1.100

BARIUM (UG/L)

DET'N LIMIT = 0.020 GUIDELINE = 1000. (A1)

JAN	44.000	17.000
FEB	53.000	22.000
MAR	55.000	39.000

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

	RAW	TREATED
--	-----	---------

MAY	48.000	11.000
	48.000	ISM
JUL	58.000	20.000
	63.000	32.000
AUG	51.000	34.000
SEP	55.000	22.000
OCT	53.000	29.000
NOV	52.000	33.000
DEC	57.000	46.000

BORON (UG/L)

DET'M LIMIT = 0.200 GUIDELINE = 5000. (A1)

JAN	89.000	86.000
FEB	140.000	120.000
MAR	450.000	330.000
MAY	350.000	53.000
	110.000	ISM
JUL	59.000	46.000
	77.000	63.000
AUG	81.000	88.000
SEP	88.000	58.000
OCT	56.000	57.000
NOV	37.000	44.000
DEC	76.000	75.000

BERYLLIUM (UG/L)

DET'M LIMIT = 0.010 GUIDELINE = N/A

JAN	.210 <T	.180 <T
FEB	.400 <T	.230 <T
MAR	.700	.310 <T
MAY	.180 <T	BDL
	.400 <T	ISM
JUL	.280 <T	.050 <T
	.210 <T	BDL
AUG	.260 <T	.240 <T
SEP	.160 <T	.030 <T
OCT	.070 <T	.040 <T
NOV	.030 <T	BDL
DEC	.090 <T	.090 <T

CADMIUM (UG/L)

DET'M LIMIT = 0.050 GUIDELINE = 5.000 (A1)

JAN	BDL	BDL
FEB	BDL	BDL
MAR	BDL	BDL
MAY	BDL	.110 <T
	BDL	ISM
JUL	BDL	BDL
	.240 <T	.100 <T
AUG	.080 <T	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW TREATED

SEP	BDL	BDL
OCT	BDL	BDL
NOV	BDL	BDL
DEC	BDL	BDL

COBALT (UG/L)

DET'M LIMIT = 0.020 GUIDELINE = N/A

JAN	.460 <T	.360 <T
FEB	.030 <T	.040 <T
MAR	.690 <T	.030 <T
MAY	.350 <T	.170 <T
	1.100	ISM
JUL	BDL	BDL
	.570 <T	BDL
AUG	.400 <T	.080 <T
SEP	BDL	.200 <T
OCT	.590 <T	.180 <T
NOV	.070 <T	BDL
DEC	BDL	BDL

CHROMIUM (UG/L)

DET'M LIMIT = 0.100 GUIDELINE = 50. (A1)

JAN	14.000	13.000
FEB	18.000	15.000
MAR	14.000	9.000
MAY	14.000	1.500
	19.000	ISM
JUL	9.500	2.700
	11.000	5.900
AUG	8.900	8.700
SEP	12.000	2.900
OCT	7.000	4.400
NOV	.360 <T	.210 <T
DEC	9.100	7.500

COPPER (UG/L)

DET'M LIMIT = .100 GUIDELINE = 1000 (A3)

JAN	1.500	1.400
FEB	1.300	1.300
MAR	3.900	1.200
MAY	1.700	1.100
	1.800	ISM
JUL	2.600	1.700
	2.200	1.600
AUG	1.800	1.000 <T
SEP	1.800	.710 <T
OCT	1.800	.620 <T
NOV	1.800	1.500
DEC	1.300 <T	.720 <T

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

IRON (UG/L)

DET'M LIMIT = 4.000 GUIDELINE = 300. (A3)

JAN	280.000	8.100 <T
FEB	200.000	10.000 <T
MAR	600.000	BDL
MAY	400.000	BDL
	420.000	ISM
JUL	610.000	BDL
	620.000	BDL
AUG	380.000	BDL
SEP	630.000	BDL
OCT	520.000	BDL
NOV	210.000	BDL
DEC	140.000	BDL

MERCURY (UG/L)

DET'M LIMIT = 0.010 GUIDELINE = 1.000 (A1)

JAN	.070	.070
FEB	.100	.120
MAR	.080	.080
MAY	.080	.090
	.080	.080 UCS
JUL	.090	.100
	.140	.130
AUG	.020 <T	.030 <T
SEP	BDL	BDL
OCT	BDL	BDL
NOV	BDL	BDL
DEC	BDL	BDL

MANGANESE (UG/L)

DET'M LIMIT = .050 GUIDELINE = 50.0 (A3)

JAN	27.000	18.000
FEB	26.000	24.000
MAR	85.000	26.000
MAY	43.000	.210 <T
	58.000	ISM
JUL	89.000	.410 <T
	100.000	.560
AUG	61.000	2.000
SEP	64.000	.340 <T
OCT	50.000	1.300
NOV	21.000	3.800
DEC	21.000	4.600

MOLYBDENUM (UG/L)

DET'M LIMIT = 0.020 GUIDELINE = N/A

JAN	.590	.770
FEB	.950	1.100
MAR	.580	1.400
MAY	1.000	1.600

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

	RAW	TREATED
--	-----	---------

MAY	1.200	1.8M
JUL	.600	1.900
	.600	1.700
AUG	.750	1.500
SEP	.460 <T	1.400
OCT	.530	1.100
NOV	.770	1.100
DEC	.760	.940

NICKEL (UG/L)

DET'M LIMIT = 0.100 GUIDELINE = 50. (F3)

JAN	BDL	BDL
FEB	.450 <T	.730 <T
MAR	.150 <T	BDL
MAY	2.000 <T	.300 <T
	4.800	1.8M
JUL	BDL	BDL
	25.000	18.000
AUG	BDL	BDL
SEP	BDL	.110 <T
OCT	BDL	BDL
NOV	.200 <T	.700 <T
DEC	BDL	BDL

LEAD (UG/L)

DET'M LIMIT = 0.050 GUIDELINE = 50. (A1)

JAN	.420	.060 <T
FEB	.480	.050 <T
MAR	3.400	.460
MAY	.780	.130 <T
	.950	1.8M
JUL	1.700	.330
	2.000	.800
AUG	1.200	.230
SEP	.870	.090 <T
OCT	.760	BDL
NOV	.380	.060 <T
DEC	.200 <T	.170 <T

ANTIMONY (UG/L)

DET'M LIMIT = .050 GUIDELINE = 146. (D4)

JAN	.310	.380
FEB	.450	.560
MAR	.430	.670
MAY	.540	.650
	.940	1.8M
JUL	.230	.570
	.370	.660
AUG	.440	.620
SEP	.310	.560

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW TREATED

OCT	.380	.540
NOV	.250	.260
DEC	.330 <T	.450 <T

SELENIUM (UG/L)

DET'M LIMIT = 0.200 GUIDELINE = 10. (A1)

JAN	1.200 <T	2.200 <T
FEB	2.000 <T	4.800 <T
MAR	3.400 <T	1.900 <T
MAY	1.400 <T	5.100 <T
	4.700 <T	ISM
JUL	3.200 <T	5.700
	BDL	4.700 <T
AUG	BDL	2.400 <T
SEP	BDL	2.000 <T
OCT	1.100 <T	1.500 <T
NOV	BDL	BDL
DEC	BDL	BDL

STROMTIUM (UG/L)

DET'M LIMIT = .050 GUIDELINE = N/A

JAN	200.000	190.000
FEB	220.000	210.000
MAR	200.000	200.000
MAY	240.000	120.000
	220.000	ISM
JUL	220.000	150.000
	200.000	170.000
AUG	200.000	190.000
SEP	240.000	150.000
OCT	230.000	200.000
NOV	250.000	250.000
DEC	270.000	280.000

TITANIUM (UG/L)

DET'M LIMIT = .050 GUIDELINE = N/A

JAN	22.000	10.000
FEB	12.000	6.400
MAR	24.000	16.000
MAY	17.000	4.300
	17.000	ISM
JUL	23.000	5.200
	16.000	4.600
AUG	15.000	9.100
SEP	14.000	4.000
OCT	19.000	5.600
NOV	16.000	11.000
DEC	13.000	11.000

THALLIUM (UG/L)

DET'M LIMIT = .010 GUIDELINE = 13. (D4)

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW TREATED

JAN	BDL	BDL
FEB	BDL	BDL
MAR	.090 <T	.030 <T
MAY	.050 <T	.060 <T
	BDL	ISM
JUL	BDL	BDL
	BDL	BDL
AUG	.050 <T	.050 <T
SEP	BDL	BDL
OCT	BDL	BDL
NOV	BDL	BDL
DEC	BDL	BDL

URANIUM (UG/L)

DET'N LIMIT = .020 GUIDELINE = 100.(B1)

JAN	2.000	1.400
FEB	2.000	1.100
MAR	1.900	.160 <T
MAY	2.200	.170 <T
	2.000	ISM
JUL	1.800	.280
	1.600	.750
AUG	1.700	.960
SEP	1.000	.160 <T
OCT	1.100	.600
NOV	2.300	1.600
DEC	2.100	2.200

VANADIUM (UG/L)

DET'N LIMIT = .050 GUIDELINE = N/A

JAN	1.000	2.200
FEB	.620	2.200
MAR	1.800	1.200
MAY	1.200	3.000
	1.500	ISM
JUL	2.300	2.800
	2.500	4.600
AUG	2.000	3.000
SEP	2.300	3.500
OCT	1.400	2.700
NOV	1.200	2.000
DEC	.560	1.200

ZINC (UG/L)

DET'N LIMIT = .001 GUIDELINE = 5000. (A3)

JAN	4.500	4.800
FEB	3.400	3.400
MAR	9.800	5.300
MAY	3.700	3.100
	6.000	ISM

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

JUL	7.200	7.400
	6.000	4.000
AUG	4.300	3.200
SEP	3.900	3.200
OCT	4.200	2.600
NOV	2.900	2.000
DEC	2.400	2.400

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

	RAW	TREATED

PESTICIDES & PCB		
ATRAZINE (NG/L)		
DET'M LIMIT = 50.00		
GUIDELINE = 60000 (B3)		
JAN	BDL	BDL
FEB	BDL	BDL
MAR	1940.000	370.000 <T
MAY	BDL	BDL
	BDL	BDL
JUL	590.000	BDL
	270.000 <T	130.000 <T
AUG	70.000 <T	BDL
SEP	330.000 <T	BDL
OCT	90.000 <T	BDL
NOV	720.000	310.000 <T
DEC	BDL	BDL

D-ETHYL ATRAZINE (NG/L)		
DET'M LIMIT = N/A		
GUIDELINE = N/A		
JAN	BDL	BDL
FEB	BDL	BDL
MAR	510.000 <T	BDL
MAY	BDL	BDL
	BDL	BDL
JUL	240.000 <T	BDL
	BDL	BDL
AUG	BDL	BDL
SEP	BDL	BDL
OCT	BDL	BDL
NOV	780.000 <T	BDL
DEC	BDL	BDL

PESTICIDES & PCB

ATRAZINE (NG/L)

DET'M LIMIT = 50.00

GUIDELINE = 60000 (B3)

JAN	BDL	BDL
FEB	BDL	BDL
MAR	1940.000	370.000 <T
MAY	BDL	BDL
	BDL	BDL
JUL	590.000	BDL
	270.000 <T	130.000 <T
AUG	70.000 <T	BDL
SEP	330.000 <T	BDL
OCT	90.000 <T	BDL
NOV	720.000	310.000 <T
DEC	BDL	BDL

D-ETHYL ATRAZINE (NG/L)

DET'M LIMIT = N/A

GUIDELINE = N/A

JAN	BDL	BDL
FEB	BDL	BDL
MAR	510.000 <T	BDL
MAY	BDL	BDL
	BDL	BDL
JUL	240.000 <T	BDL
	BDL	BDL
AUG	BDL	BDL
SEP	BDL	BDL
OCT	BDL	BDL
NOV	780.000 <T	BDL
DEC	BDL	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

PHENOLICS		
PHENOLICS (UG/L)		
		DET'N LIMIT = 0.2 * GUIDELINE = 2.00 (A3)
JAN	1.600	2.000
FEB	1.600	1.200
MAR	5.000	2.200
MAY	1.800	1.400
	1.000	.600 <T
JUL	5.600	.600 <T
	3.000	1.600
AUG	1.000	.800 <T
SEP	2.800	1.800
OCT	4.600	1.000
NOV	1.200	1.000
DEC	.400 <T	.400 <T

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINGTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW TREATED

VOLATILES

BENZENE (UG/L)

DET'M LIMIT = .050 GUIDELINE = 5.0 (B1)

JAN	BDL	BDL
FEB	BDL	BDL
MAR	BDL	BDL
MAY	BDL	BDL
	BDL	BDL
JUL	BDL	.050 <T
	BDL	BDL
AUG	BDL	BDL
SEP	BDL	BDL
OCT	BDL	BDL
NOV	BDL	BDL
DEC	BDL	BDL

TOLUENE (UG/L)

DET'M LIMIT = .050 GUIDELINE = 24.0 (B4)

JAN	.800 UCR	.050 <T
FEB	BDL	.150 <T
MAR	BDL	BDL
MAY	BDL	BDL
	.050 <T	.050 <T
JUL	.300 <T	.350 <T
	BDL	.150 <T
AUG	BDL	.050 <T
SEP	BDL	.100 <T
OCT	BDL	BDL
NOV	BDL	.050 <T
DEC	.100 <T	.100 <T

ETHYLBENZENE (UG/L)

DET'M LIMIT = .050 GUIDELINE = 2.4 (B4)

JAN	.200 <T	BDL
FEB	.600	.250 <T
MAR	BDL	BDL
MAY	.050 <T	BDL
	BDL	BDL
JUL	.200 <T	.100 <T
	.100 <T	.050 <T
AUG	.050 <T	BDL
SEP	BDL	BDL
OCT	BDL	BDL
NOV	BDL	BDL
DEC	.050 <T	BDL

M-XYLENE (UG/L)

DET'M LIMIT = .100 GUIDELINE = 300 (B4)

JAN	.600 <T	BDL
FEB	2.400	.900 <T
MAR	BDL	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW

TREATED

MAY	BDL	BDL
	BDL	BDL
JUL	.300 <T	.200 <T
	.300 <T	.100 <T
AUG	.100 <T	BDL
SEP	BDL	BDL
OCT	BDL	BDL
NOV	BDL	BDL
DEC	BDL	BDL

O-XYLENE (UG/L)

DET'N LIMIT = .050 GUIDELINE = 300 (B4)

JAN	.200 <T	BDL
FEB	1.050	.400 <T
MAR	BDL	BDL
MAY	.050 <T	BDL
	BDL	BDL
JUL	BDL	.100 <T
	.200 <T	.050 <T
AUG	.050 <T	BDL
SEP	BDL	BDL
OCT	BDL	BDL
NOV	BDL	BDL
DEC	.050 <T	.050 <T

STYRENE (UG/L)

DET'N LIMIT = .050 GUIDELINE = 46.5 (D2)

JAN	.200 <T	.100 <T
FEB	.600	.150 <T
MAR	.150 <T	BDL
MAY	.100 <T	.100 <T
	.050 <T	.100 <T
JUL	1.750 UCS	.100 <T
	.100 <T	.150 <T
AUG	.200 <T	.100 <T
SEP	BDL	.150 <T
OCT	BDL	.150 <T
NOV	.050 <T	.150 <T
DEC	.050 <T	.150 <T

CHLOROFORM (UG/L)

DET'N LIMIT = .100 GUIDELINE = 350 (A1+)

JAN	BDL	11.000
FEB	BDL	8.500
MAR	BDL	4.700
MAY	BDL	59.300
	BDL	35.400
JUL	BDL	62.000
	BDL	44.300
AUG	.200 <T	44.600

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

	RAW	TREATED
--	-----	---------

SEP	BDL	32.300
OCT	BDL	48.300
NOV	BDL	40.600
DEC	BDL	14.300

111, TRICHLOROETHANE (UG/L)

DET'M LIMIT = .020 GUIDELINE = 200 (D1)

JAN	.100 <T	.040 <T
FEB	.240	.160 <T
MAR	BDL	BDL
MAY	BDL	BDL
	BDL	BDL
JUL	.140 <T	BDL
	BDL	BDL
AUG	BDL	BDL
SEP	BDL	BDL
OCT	BDL	BDL
NOV	.040 <T	BDL
DEC	.280	.120 <T

DICHLOROBROMOMETHANE (UG/L)

DET'M LIMIT = .050 GUIDELINE = 350 (A1+)

JAN	BDL	5.200
FEB	BDL	3.850
MAR	BDL	2.300
MAY	BDL	15.500
	BDL	17.600
JUL	BDL	18.800
	BDL	11.650
AUG	BDL	16.350
SEP	BDL	12.000
OCT	BDL	17.050
NOV	BDL	14.150
DEC	BDL	8.150

CHLORODIBROMOMETHANE (UG/L)

DET'M LIMIT = .100 GUIDELINE = 350 (A1+)

JAN	BDL	1.000
FEB	BDL	.800 <T
MAR	BDL	.300 <T
MAY	BDL	5.600
	BDL	8.200
JUL	BDL	7.300
	BDL	4.100
AUG	BDL	5.100
SEP	BDL	4.900
OCT	BDL	4.600
NOV	BDL	2.500
DEC	BDL	1.800

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM ALVINSTON WTP 1989

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

RAW		TREATED

T-CHLOROETHYLENE (UG/L)		DET'N LIMIT = .050 GUIDELINE = 10.0 (C2)
JAN	BDL	.050 <T
FEB	.100 <T	.100 <T
MAR	BDL	BDL
MAY	BDL	BDL
	BDL	BDL
JUL	BDL	BDL
	BDL	BDL
AUG	BDL	.050 <T
SEP	BDL	BDL
OCT	BDL	BDL
NOV	BDL	BDL
DEC	.100 <T	BDL

BROMOFORM (UG/L)		DET'N LIMIT = .200 GUIDELINE = 350 (A1+)
JAN	BDL	BDL
FEB	BDL	BDL
MAR	BDL	BDL
MAY	BDL	.400 <T
	BDL	.800 <T
JUL	BDL	.600 <T
	BDL	.400 <T
AUG	BDL	.400 <T
SEP	BDL	.600 <T
OCT	BDL	.400 <T
NOV	BDL	BDL
DEC	BDL	BDL

TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = .500 GUIDELINE = 350 (A1)
JAN	BDL	17.200
FEB	BDL	13.150
MAR	BDL	7.300
MAY	BDL	80.800
	BDL	62.000
JUL	BDL	88.700
	BDL	60.450
AUG	BDL	66.450
SEP	BDL	49.800
OCT	BDL	70.350
NOV	BDL	57.250
DEC	BDL	24.250

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

Table 6

SCAN/PARAMETER	UNIT	DETECTION	
		LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILTRATION	CT/ML	0	500/ML (A1)
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100mL (A1)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
CHLOROAROMATICS			
HEXACHLOROBUTADIENE	NG/L	1.000	450. (D4)
1,2,3-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,4-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.000	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.000	10000 (D4)
HEXACHLOROBENZENE	NG/L	1.0	10. (C1)
HEXACHLOROETHANE	NG/L	1.000	1900. (D4)
OCTACHLOROSTYRENE	NG/L	1.000	N/A
PENTACHLOROBENZENE	NG/L	1.000	74000 (D4)
2,3,6-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,6,A-TRICHLOROTOLUENE	NG/L	5.000	N/A
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	50.	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	50.	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	50.	N/A
2,4,5-TRICHLOROPHENOL	NG/L	50.	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	50.	2000. (B4)
PENTACHLOROPHENOL	NG/L	50.	30000. (B4)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD PH	DMSNLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	°C	N/A	<15 °C (A1)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	.200	30-500 (A4)
CALCIUM	MG/L	.100	100. (F2)
CYANIDE	MG/L	.001	.20 (A1)
CHLORIDE	MG/L	.200	250. (A3)
COLOUR	TCU	.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.	400. (F2)
FLUORIDE	MG/L	.01	2.4 (A1)
HARDNESS	MG/L	.50	80-100 (A4)
MAGNESIUM	MG/L	.05	30. (F2)

SCAN/PARAMETER	UNIT	DETECTION	
		LIMIT	GUIDELINE
NITRITE	MG/L	.001	1.0 (A1)
TOTAL NITRATES	MG/L	.02	10. (A1)
NITROGEN TOTAL KJELDAHL	MG/L	.02	N/A
PH	DMSNLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	.0005	N/A
PHOSPHORUS TOTAL	MG/L	.002	.40 (F2)
SULPHATE	MG/L	.200	500. (A3)
TOTAL SOLIDS	MG/L	1.	500. (A3)
TURBIDITY	FTU	.02	1.0 (A1)

METALS

ALUMINUM	UG/L	.050	100. (A4)
ANTIMONY	UG/L	.050	10. (F3)
ARSENIC	UG/L	.050	50. (A1)
BARIUM	UG/L	.020	1000. (A1)
BORON	UG/L	.200	5000. (A1)
BERYLLIUM	UG/L	.010	0.20 (H)
CADMIUM	UG/L	.050	5.0 (A1)
COBALT	UG/L	.020	1000. (H)
CHROMIUM	UG/L	.100	50. (A1)
COPPER	UG/L	.100	1000. (A3)
IRON	UG/L	5.0	300. (A3)
MERCURY	UG/L	.01	1.0 (A1)
MANGANESE	UG/L	.050	50. (A3)
MOLYBDENUM	UG/L	.020	500. (H)
NICKEL	UG/L	.100	50. (F3)
LEAD	UG/L	.020	50. (A1)
SELENIUM	UG/L	.200	10. (A1)
SILVER	UG/L	.020	50. (A1)
STRONTIUM	UG/L	.100	2000. (H)
THALLIUM	UG/L	.010	13. (D4)
TITANIUM	UG/L	.100	N/A
URANIUM	UG/L	.020	20. (A2)
VANADIUM	UG/L	.020	100. (H)
ZINC	UG/L	.020	5000. (A3)

PHENOLICS

PHENOLICS (UNFILTERED REACTIVE)	UG/L	.2	2.0 (A3)
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PESTICIDES & PCB

ALDRIN	NG/L	1.0	700. (A1)
AMETRINE	NG/L	50.	300000. (D3)
ATRAZINE	NG/L	50.	60000. (B3)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700. (G)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300. (G)
GAMMA HEXACHLOROCYCLOHEXANE (LINDANE)	NG/L	1.0	4000. (A1)
ALPHA CHLORDANE	NG/L	2.0	7000. (A1)
GAMMA CHLORDANE	NG/L	2.0	7000. (A1)
BLADEX	NG/L	100.	10000. (B3)
DIELDRIN	NG/L	2.0	700. (A1)
METHOXYCHLOR	NG/L	5.0	900000. (B1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000. (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	4.0	74000. (D4)
ENDRIN	NG/L	4.0	200. (A1)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	4.0	N/A

SCAN/PARAMETER	DETECTION		
	UNIT	LIMIT	GUIDELINE
HEPTACHLOR EPOXIDE	NG/L	1.0	3000. (A1)
HEPTACHLOR	NG/L	1.0	3000. (A1)
METOLACHLOR	NG/L	500.	50000. (B3)
MIREX	NG/L	5.0	N/A
OXYCHLORDANE	NG/L	2.0	N/A
O,P-DDT	NG/L	5.0	30000. (A1)
PCB	NG/L	20.0	3000. (A2)
O,P-DDD	NG/L	5.0	N/A
PPDDE	NG/L	1.0	30000. (A1)
PPDDT	NG/L	5.0	30000. (A1)
ATRATONE	NG/L	50.	N/A
ALACHLOR	NG/L	500.	35000. (D2)
PROMETONE	NG/L	50.	52500. (D3)
PROPAZINE	NG/L	50.	16000. (D2)
PROMETRYNE	NG/L	50.	1000. (B3)
SENCOR (METRIBUZIN)	NG/L	100.	80000. (B2)
SIMAZINE	NG/L	50.	10000. (B3)

POLYAROMATIC HYDROCARBONS

PHENANTHRENE	NG/L	10.0	N/A
ANTHRACENE	NG/L	1.0	N/A
FLUORANTHENE	NG/L	20.0	42000. (D4)
PYRENE	NG/L	20.0	N/A
BENZO(A)ANTHRACENE	NG/L	20.0	N/A
CHRYSENE	NG/L	50.0	N/A
DIMETHYL BENZO(A)ANTHRACENE	NG/L	5.0	N/A
BENZO(E)PYRENE	NG/L	50.0	N/A
BENZO(B)FLUORANTHENE	NG/L	10.0	N/A
PERYLENE	NG/L	10.0	N/A
BENZO(K)FLUORANTHENE	NG/L	1.0	N/A
BENZO(A)PYRENE	NG/L	5.0	10. (B1)
BENZO(G,H,I)PERYLENE	NG/L	20.0	N/A
DIBENZO(A,H)ANTHRACENE	NG/L	10.0	N/A
INDENO(1,2,3-C,D)PYRENE	NG/L	20.0	N/A
BENZO(B)CHRYSENE	NG/L	2.0	N/A
CORONENE	NG/L	10.0	N/A

SPECIFIC PESTICIDES

TOKAPHENE	NG/L	N/A	5000. (A1)
2,4,5-TRICHLOROBUTYRIC ACID (2,4,5-T)	NG/L	50.	200000. (B4)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000. (A1)
2,4-DICHLOROPHENOXYPYRIC ACID	NG/L	200.	18000. (B3)
2,4-D PROPIONIC ACID	NG/L	100.	N/A
DICAMBA	NG/L	100.	120000. (B1)
PICLORAM	NG/L	100.	190000. (B3)
SILVEX (2,4,5-TP)	NG/L	50.	10000. (A1)
DIAZINON	NG/L	20.	20000. (B1)
DICHLOROVOS	NG/L	20.	N/A
DURSBAN	NG/L	20.	N/A
ETHION	NG/L	20.	35000. (G)
GUTHION(AZINPHOSMETHYL)	NG/L	N/A	20000. (B1)
MALATHION	NG/L	20.	190000. (B1)
MEVINPHOS	NG/L	20.	N/A
METHYL PARATHION	NG/L	50.	7000. (A1)
METHYLTRITHION	NG/L	20.	N/A

SCAN/PARAMETER	DETECTION		GUIDELINE
	UNIT	LIMIT	
PARATHION	NG/L	20.	50000. (B1)
PHORATE (THIMET)	NG/L	20.	2000. (B3)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
AMINOCARB	NG/L	N/A	N/A
BENONYL	NG/L	N/A	N/A
BUX (METALKAMATE)	NG/L	2000.	N/A
CARBOFURAN	NG/L	2000.	90000. (B1)
CICP (CHLORPROPHAM)	NG/L	2000.	350000. (G)
DIALLATE	NG/L	2000.	30000. (H)
EPTAM	NG/L	2000.	N/A
IPC	NG/L	2000.	N/A
PROPOXUR (BAYGON)	NG/L	2000.	90000. (G)
SEVIN (CARBARYL)	NG/L	200.	90000. (B1)
SUTAN (BUTYLATE)	NG/L	2000.	245000. (D3)

VOLATILES

BENZENE	UG/L	.050	5.0 (B1)
TOLUENE	UG/L	.050	24.0 (B4)
ETHYLBENZENE	UG/L	.050	2.4 (B4)
PARA-XYLENE	UG/L	.100	300. (B4)
META-XYLENE	UG/L	.100	300. (B4)
ORTHO-XYLENE	UG/L	.050	300. (B4)
1,1-DICHLOROETHYLENE	UG/L	.100	7.0 (D1)
ETHYLENE DIBROMIDE	UG/L	.05	.05 (G)
METHYLENE CHLORIDE	UG/L	.500	50. (B1)
TRANS-1,2-DICHLOROETHYLENE	UG/L	.100	70. (D5)
1,1-DICHLOROETHANE	UG/L	.100	N/A
CHLOROFORM	UG/L	.100	350. (A1+)
1,1,1-TRICHLOROETHANE	UG/L	.020	200. (D1)
1,2-DICHLOROETHANE	UG/L	.050	5.0 (D1)
CARBON TETRACHLORIDE	UG/L	.200	5.0 (B1)
1,2-DICHLOROPROPANE	UG/L	.050	6.0 (D5)
TRICHLOROETHYLENE	UG/L	.100	50. (B1)
DICHLOROBROMOMETHANE	UG/L	.050	350. (A1+)
1,1,2-TRICHLOROETHANE	UG/L	.050	.60 (D4)
CHLORODIBROMOMETHANE	UG/L	.100	350. (A1+)
TETRACHLOROETHYLENE	UG/L	.050	10.0 (C2)
BROMOFORM	UG/L	.200	350. (A1+)
1,1,2,2-TETRACHLOROETHANE	UG/L	.050	0.17 (D4)
CHLOROBENZENE	UG/L	.100	60. (D5)
1,4-DICHLOROBENZENE	UG/L	.100	1.0 (B4)
1,3-DICHLOROBENZENE	UG/L	.100	130. (G)
1,2-DICHLOROBENZENE	UG/L	.050	3.0 (B4)
TRIFLUOROCHLOROTOLUENE	UG/L	.100	N/A
TOTAL TRIHALOMETHANES	UG/L	.500	350. (A1)
STYRENE	UG/L	.05	140. (D5)